

CINNA AND LIMNODEA (POACEAE): NOT CONGENERIC

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A decade after Clayton and Renvoize (1986) suggested that *Limnodea* L.H. Dewey is "a prairie version of *Cinna*," Tucker (1996) reduced this long-recognized grass taxon to synonymy under *Cinna* L. As the only justification for the change he noted that *Limnodea arkansana* (Nuttall) Dewey "has been treated as constituting a monotypic genus ... but there seem to be no compelling differences other than length of lemma awn, a minor distinction." We regard this nomenclatural aberration as being unsupportable. A similar reduction of *Limnodea* to synonymy occurred in 1841 when Trinius in Steudel (Steudel 1841) transferred it to *Limnas*, a Siberian genus of two species from which *Limnodea* differs in several features (Bentham 1881). (On the basis of the lemma awn of *Limnodea* alone, the genus could just as well be allied with *Stipa*.)

Our purpose in this note is to point out that, in addition to features of the awn, there are indeed other compelling differences between *Limnodea* and *Cinna* and that considering these two taxa to be congeneric is untenable. Unfortunately the new combination has already been adopted in two recent floras (Wunderlin 1998; Yatskievych 1999).

Nuttall (1835–1836) recognized that a grass he had in hand constituted a distinct genus, which he called *Greenia* Nutt. Unfortunately, this was a preoccupied name, as were two other generic names later applied to the genus, *Sclerachne* Torrey in Trinius (Trinius 1841) and *Thurberia* Bentham (Bentham 1881). Finally, Dewey (1894) published the generic name *Limnodea*, which has hitherto remained unchallenged. Whatever the generic name, for over a century and a half *Limnodea* has been recognized as distinct by agrostologists and other botanists (except Tucker and the two authors of floras cited above) who have dealt with it; we list some of these here (e.g., Allen 1980; Beal 1896; Beetle 1977; Bentham 1881; Bentham & Hooker 1883; Bews 1929; Campbell 1985; Clayton & Renvoize 1986; Correll & Johnston 1970; Dewey 1894; Diggs et al. 1999; Dore 1956; Featherly 1946; Gould 1968, 1975, 1979; Gould & Box 1965; Gould & Shaw 1983; Great Plains Flora Association 1977, 1986; Hackel 1887, 1890; Hatch et al. 1999; Hitchcock 1920, 1935, 1937, 1951; Johnston 1990; Kartesz 1994; Kartesz & Meacham 1999; Lamson-Scribner 1900a, 1900b; Lonard 1993; Powell 1994; Shinnars 1972; Silveus 1933; E.B. Smith 1994; J.P. Smith 1981; Stebbins & Crampton 1961; Terrell 1971; Vasey 1883, 1885; Watson & Dallwitz 1992). The genus *Limnodea* is also recognized in the Missouri Botanical Garden's New World Grass Checklist (<www.mobot.org/mobot/tropicos/Poa/Limnodea.html> Accessed 1999 September 30) and in the Texas A&M University Grass Images (<<http://www.csdl.tamu.edu/FLORA/image/k4606700.htm>> Accessed 1999 September 30).

TABLE 1. Comparison of various characters of *Cinna* and *Limnodea*.

Character	<i>Cinna</i>	<i>Limnodea</i>
Flowering/ fruiting time	Late estival/autumnal	Late hibernal/vernal
Duration	Perennial	Short-lived annual
Spikelet compression	Laterally compressed	Subterete
Texture of glumes	Membranous	Chartaceous*
Abaxial surface of glumes	Sharply keeled	Rounded (or broadly keeled in distal portion)
Margin of glumes	Flat, hyaline	Inrolled, not hyaline
Vestiture of glumes	Sparingly to moderately scabrous	Sparingly to densely scabrous or pilose especially on veins (var. <i>pilosa</i> (Trin.) Scribn.)
Texture of lemma	Membranous	Chartaceous
Abaxial surface of lemma	Sharply keeled	Rounded
Awn	Much shorter than spikelet, straight, not twisted, not hygroscopic, or lacking	Much longer than spikelet, geniculate, twisted proximally, hygroscopic
Palea	Well developed, prominent, relatively long compared to lemma	Poorly developed, relatively short compared to lemma
Veins of palea	1 or if 2, these closely approximate, in either case extending to or nearly to tip of palea	2-veined only at base
Number of stamens	1 or 2	3
Endosperm	Semi-liquid ("soft- fleshy") (Terrell 1971; Dore 1956)	Liquid (Brown 1955; Terrell 1971; Dore 1956)
Chromosome number	2 <i>n</i> = 28 (Bowden 1960; Davidse & Pohl 1978; Pohl & Davidse 1971)	2 <i>n</i> = 14 (Watson & Dallwitz 1992 onward)
Articulation	Spikelets not readily disarticulating	Spikelets readily disarticulating
Habitat	Woods	Prairies and disturbed areas

*The describer of *Limnodea*, Nuttall (1835–1836), wrote of the glumes as being "coriaceus" and, in English translation, as "indurated." His adjectives formed the basis for Torrey's new name, *Sclerachne*.

Cinna was recently revised by Brandenburg et al. (1991). Differences between its four species and *Limnodea* are summarized in Table 1.

True it is, of course, that *Limnodea* and *Cinna* share certain features. Among these are 1-flowered spikelets, articulation below the glumes, extended rachilla, and awned spikelets (sometimes awnless in *Cinna*). Each of these features is found in other genera of Agrostideae sensu Hitchcock (1951). The combination of the four may be unique to *Cinna* and *Limnodea*—it is among U.S. grasses—and may indicate a possible relationship between the two genera. Bentham and Hooker (1883) suggested a resemblance between *Limnodea* and *Polypogon*; Nuttall (1835–1836) considered *Limnodea* to be “allied to *Oryzopsis*.” However, resemblance and possible relationship are not necessarily the same. Combining the two genera because of a feature of the awn is, we suggest, most emphatically negated by the many other features separating them.

Distinguishing among the spikelets of the species of *Cinna* takes some experience, but distinguishing between spikelets of *Cinna* and those of *Limnodea* takes hardly more than a glance. As an experiment we removed the awns of several spikelets of *Limnodea* and then mixed them with a number of *Cinna* spikelets representing all four species of that genus. Next we invited several colleagues to examine the mixture under a dissection scope to determine which spikelets “did not belong.” No one had any trouble pointing out the *Limnodea* spikelets—even without their conspicuous awns—as the “different” ones.

The genera *Cinna* and *Limnodea* are easily separable by the following synoptic key.

1. Spikelets laterally compressed; glumes membranous, sharply keeled; lemmas awnless or with a straight awn much shorter than the spikelet; palea well developed, relatively long compared to lemma, the veins 1 or 2, extending to or nearly to palea tip, when veins 2, the veins closely approximate; stamens 1 or 2; late estival/autumnal perennials

Cinna
1. Spikelets subterete; glumes chartaceous, rounded on back; lemmas with a geniculate, twisted, hygroscopic awn much longer than the spikelet; palea poorly developed, relatively short compared to lemma, 2-veined only at base; stamens 3; short-lived, late hibernal/vernal annual

Limnodea

CONCLUSION

The inclusion of *Limnodea* in *Cinna* introduces a markedly discordant element into the latter small and well-circumscribed genus. The four currently recognized species of *Cinna* are quite similar to each other and all differ consistently from the monotypic *Limnodea* in several significant features, especially in the strikingly different spikelet morphology. These genera are not congeneric.

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